

# The Sustainable Long-Term Storage and Management of Archaeological Collections: Learning from International Best Practice



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Winston Churchill Memorial Trust Fellow 2023

## **ACKNOWLEDGEMENTS**

With particular thanks to the generosity of the Winston Churchill Memorial Trust for providing the support necessary for me undertake this work. I would also like to thank those people and institutions who so generously shared their time and knowledge: Michol Stocco, Museum of London; Duncan Brown, Heritage England; Samantha Paul; Tim Evans, Archaeological Data Service; Amanda Sutphin, New York City Archaeological Repository; Patricia Sanford, Maryland Archaeological Conservation Laboratory; and Jack Gary, Colonial Williamsburg.

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## EXECUTIVE SUMMARY

Archaeological projects result in archaeological archives, which consist of physical and documentary material related to and recovered during that project. Internationally, such archives are retained in archaeological archives to mitigate the destructive nature of archaeological excavations, to ensure that the conclusions of the project are transparent and to enable the data from that project to be reused. There are few institutions in Aotearoa, however, that collect and retain archaeological archives, putting our unique archaeological heritage – and our ability to understand our past – at risk.

For my Winston Churchill Memorial Trust Fellowship, I visited both physical and digital archaeological repositories in England and the United States and met with experts there to discuss how their repositories run, the challenges they face and to learn more about archaeological archiving. The key lessons I learned were:

- Financial sustainability for an archaeological repository is difficult to achieve on a per box charging model.
- Digital archives are complex to manage and require a specialist skill set. Long-term archiving of this material should only be undertaken by an organisation with the necessary expertise and accreditation.
- Storage space will always be at a premium.
- It is critical to budget for archiving costs (both time and the deposit fees) at the outset of an archaeological project, in the same way that any other cost must be budgeted for.
- Guidance about the transfer of ownership of archaeological archives is useful for all stakeholders, as is a template for facilitating this arrangement.
- Not everything needs to be retained. Selection strategies ensure that the decisions about what is selected and what is not are clear and robust.
- Research frameworks are an important tool to help guide the selection of material for an archaeological archive.
- Standards and guidance are critical for the efficient and sustainable function of the repository.
- The reuse of archaeological archives is not well understood.
- Websites are a critical part of outreach programmes.
- A holistic approach to the development of a repository is required, and a flexible solution is likely to be the most sustainable long-term solution.

To develop a solution to Aotearoa's collections crisis will take time, and must commence with engagement with iwi Māori. It will also require work between a number of stakeholders, including

NZAA, HNZPT, Manatū Taonga and the museums sector. To this end, I have already shared the results of my fellowship with the Heritage New Zealand Pouhere Taonga Board, the Māori Heritage Council and at the New Zealand Archaeological Association conference. Perhaps the most important outcome, however, is a position paper on the long-term storage of archaeological collections for the New Zealand Archaeological Association (co-authored with Emma Ash and still in draft at the time of writing). This position paper contains a number of recommendations for future work (these are not outlined here, as the paper is awaiting final approval).

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## INTRODUCTION

One of the major challenges that faces archaeology and archaeologists in Aotearoa New Zealand today is that there is no long-term protection of most archaeological material, and there are few places for that material to go. For the purposes of this report, 'archaeological material' is defined as all the documents, images, notes, research material, samples and artefacts generated during the course of an archaeological project. This is also known as an archaeological archive. The physical size of this issue is one that grows with each passing year, as the volume of archaeological projects carried out continues to increase, and thus the volume of archaeological material generated also continues to grow. With nowhere for much of that material to be stored, Aotearoa is at risk of losing highly significant archaeological collections – collections that are crucial for understanding our past. My Winston Churchill Memorial Trust Fellowship project was born of a desire to investigate how other countries – specifically, England and the United States of America – manage this challenge. To this end, I visited five archaeological repositories in these countries, and met with two other experts in the field, to discuss how these repositories operate, the challenges they face and learn about how best we could address this challenge in Aotearoa.<sup>1</sup>

## BACKGROUND

### What is the archaeological archive?

Archaeological excavation is an inherently destructive process, in that it destroys what is excavated. As such, it is international best practice that, in addition to archaeological excavations being reported on, the archaeological material from a project should be archived. In this case, 'archaeological material' refers to not just the artefacts and samples recovered from the site, but also the data that sits alongside this: the field notes, photographs, maps, plans, stratigraphic drawings, GIS data, photogrammetry models and artefact spreadsheets/databases, amongst other things. Together, this forms what is known internationally as the archaeological archive (also referred to here as an archaeological collection). In Europe, an archaeological archive is defined as:

All records and materials recovered during an archaeological project and identified for long-term preservation, including artefacts, ecofacts and other environmental remains, waste products, scientific samples and also written and visual documentation in paper, film and digital form.

Perrin et al. 2014: 20.

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<sup>1</sup> An archaeological repository is essentially a storage facility for archaeological materials. It might only store physical materials, or digital materials, or it might store both. It might be part of a museum or other institution, such as a museum or a marae, or it might be a standalone organisation.

Given Aotearoa's unique cultural context, this definition may not be the most appropriate one, but it has the advantage of having been proven to work and provides a useful starting point for this document.

The archaeological archive is retained for a number of reasons, but chief amongst them is to ensure that the conclusions and interpretations drawn about a particular site are transparent and can be revisited. Further, retaining an archaeological archive enables other researchers to revisit the site with different questions in mind, or in light of new information that might change the original interpretation of the site. As Hedley Swain has said,

The creation of stable, consistent, logical, and accessible archives from fieldwork is a fundamental building block of archaeological activity. Since the discipline emerged in the late 19th and early 20th centuries, it has been recognised that the process of excavation is destructive and that no archaeological interpretations are sustainable unless they can be backed up with the evidence of field records and post-excavation analysis. Such records and analysis should be available for re-examination and re-interpretation.

Brown 2011: Foreword.

The archaeological archive has two main components: documentary (such as field notes, drawings, site plans, photographs, GIS data, etc) and physical (such as artefacts and samples; Perrin et al. 2014: 20). The documentary archive is increasingly digital in form, which raises its own particular challenges with regard to long-term storage, as discussed in more detail below.

### The role of archaeological repositories

Archaeological repositories exist in many jurisdictions around the world. In some instances these are purely digital, designed to hold only the documentary archive of the archaeological work. In other cases, they hold both the documentary and the material archive. Some are part of museums, but others are standalone facilities. Some run outreach, education and research programmes of their own, while others act only as a repository. All have detailed standards and guidance about the condition the archive must be in when it is deposited. In most cases, this includes how artefacts and samples are packaged and labelled, the types of records that must be submitted as part of the collection, the format digital files must be in and the information that must be supplied about the artefacts and samples that have been submitted.

Aotearoa has no standalone archaeological repositories and few museums or other institutions (such as universities) take collections of archaeological material, due to funding and storage constraints, and the difficulties of storing archaeological collections, which are often large. Some marae have whare taonga, and the example of Takahanga Marae in Kaikoura is a particularly good one. The extent to which whare taonga retain complete archaeological archives is currently unclear. The desire of many iwi Māori to retain kaitiakitanga over all or part of the archaeological archive from archaeological sites of interest to them must be at the forefront of any conversations about archaeological repositories and archaeological archives in Aotearoa. Likewise, Māori data sovereignty must also be a fundamental part of such discussions.

### Legislation and the archaeological archive in Aotearoa: an overview

While there is legislative protection of archaeological sites in Aotearoa, the only archaeological material that is protected by law in New Zealand is taonga tūturu (treasured objects; defined in the Protected Objects Act 1975 as an object that relates to Māori culture, history, or society; and has been manufactured or modified in New Zealand by Māori; or, brought into New Zealand by Māori; or, used by Māori; and is more than 50 years old). Artefacts and samples recovered from archaeological sites that do not fall within this definition are owned by the landowner at the time the archaeological work is carried out and that landowner can do what they want with them. Further, there is no legislative protection of the documentary archive (although a final report on any work carried out as a result of an archaeological authority must be submitted to Heritage New Zealand Pouhere Taonga (HNZPT) and is made publicly available via their digital library). Even if such legislative protections did exist, there is often no home for archaeological archives, due to the lack of institutions prepared to retain such material.

### *Heritage New Zealand Pouhere Taonga's role*

HNZPT is the government agency charged with identifying, preserving and promoting Aotearoa's unique heritage. As part of its role, it issues authorities for the excavation of archaeological sites formed prior to 1900. It is through this process that almost the entirety of Aotearoa's archaeological archive is produced. As such, HNZPT have produced some guidance on how to manage archaeological material. This is contained in four documents:

- "Information sheet: managing archaeological material" (HNZPT 2014)
- *Statement of General Policy: The Administration of the Archaeological Provisions under the Heritage New Zealand Pouhere Taonga Act 2014* (HNZPT 2015)

- *Guidelines for the Finding of Artefacts* (HNZPT 2019)
- *Archaeological Report Guidelines* (HNZPT 2023)

HNZPT's (2014) "Information sheet: managing archaeological material" is a document with no legal standing but, as the title suggests, provides archaeologists with some information about how they can manage archaeological collections (V. Tanner, HNZPT, pers. comm., 7/11/2013). It is the only one of the HNZPT documents to define 'archaeological material' (none of the other HNZPT documents refer to either this document or this definition). Of concern is that this definition is limited to the physical material excavated from the site, with no mention made of the associated documentary record. The document recognises the need to manage archaeological material, and that this management should begin at the start of the project, with the development of both an artefact retention, sampling and discard policy and an artefact management plan. It outlines some of the factors that need to be taken into account when considering disposing of archaeological material, including both archaeological and cultural values. It also recommends that information about the location of any archaeological material be included in the final report for the archaeological authority, and in the site record form.<sup>2</sup> This requirement is a good one (and is echoed in the *Archaeological Report Guidelines*; HNZPT 2023), but it is important to note that the final location of the archaeological material may not have been determined at the time the report is completed and that the report is a static record. Updating the site record form with this information is more useful, as this is a dynamic record and can continue to be updated if and when the location of the material changes. The Central Filekeeper (who oversees the day-to-day operations of ArchSite) reports that updates to site record forms about the location of archaeological material for a given site are infrequent (M. O'Keeffe, pers. comm., 31/10/2023). Further, ArchSite is not currently set up to record this information in any standardised way, but this would theoretically be possible in the future.

The information sheet makes the point that "archaeological laboratories are not normally appropriate for the long term care of archaeological material or archaeological archives (digital and hard copy field records and photographs)" but does not provide any advice about what to do if this option is the only one available (HNZPT 2014: 4). In addition, the use of the term 'archaeological laboratory' is somewhat narrow and misleading, as few archaeological consultants are likely to regard themselves as having a laboratory. The document's use of the term 'disposal' is also problematic. Although defined in the

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<sup>2</sup> Archaeological authorities require that the site record form for the archaeological site(s) investigated are updated at the completion of works. These site record forms are held in ArchSite, a digital repository of recorded archaeological sites in Aotearoa.

document, the definition used is considerably broader than a strict dictionary definition of disposal and includes a range of possible outcomes, such as the transfer of material to another party, destruction, reburial and/or display (HNZPT 2014: 4).

While acknowledging that any material that is not taonga tūturu remains the property of the landowner at the time the archaeological work was carried out, the information sheet does not provide any advice on how to arrange the transfer of ownership of such material to another party, or even if this is possible, or if there might be alternative means of dealing with this issue (for example, loan arrangements). These matters are not addressed in any of the other HNZPT documents consulted. Nor do any of the documents address the issue of Māori data sovereignty, although (where relevant) they do recommend consultation with the relevant iwi and/or hapū.

HNZPT's (2015) statement of general policy on archaeology "encourages" archaeologists to work with iwi and hapū to determine how and whether or not to retain or dispose of archaeological material (other than taonga tūturu) following excavation.<sup>3</sup> However, there are no references to European archaeological material, no definition of what archaeological material might consist of and no reference to the 2014 information sheet. The general policy statement also "encourages" the archaeological authority holder to make provision for the long-term curation of any archaeological material recovered during the on-site work (HNZPT 2015: 13). There is no guidance, though, about where and what appropriate long-term curation might look like, and nor is there any recognition of the fact that few institutions offer such a facility.

The 2019 *Guidelines for the Finding of Artefacts* focus on practical guidance, from the details of packaging and labelling through to who should be consulted when artefacts of different types are found. The focus here is specifically on archaeological artefacts and samples, and there is no consideration of the documentary archive. The information about how best to package and label artefacts is limited, with the guidelines rightly noting that individual institutions will have their own requirements for this and should be consulted for this information. This document acknowledges the challenge of finding a long-term home for archaeological archives. It also states that splitting up an archive into different components is not desirable. Further, it suggests that there needs to be discussion between the New Zealand Archaeological Association (NZAA) and Manatū Taonga Ministry for Culture and Heritage about the options for the long-term storage of archaeological archives.

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<sup>3</sup> The statement of general policy will be reviewed in the near future, pending re-issue in 2025.

As already noted, the *Archaeological Report Guidelines* (HNZPT 2023) recommend that the report metadata states where the “material remains and samples” are located when the report is completed (the report metadata is to be included in a table in Appendix 1 of the report; HNZPT 2023: 13). In addition, the guidelines also recommend that the location of the project documentation is noted, but there is no definition of what such documentation might consist of, no discussion of how this should be prepared and no definition of the phrase “material remains and samples”. The guidelines also recommend that the methodology section of the report outlines the collection and disposal strategy used for the archaeological materials from the site(s) being investigated.

Of note is that none of these documents contain a specific statement about the importance and value of the archaeological archive, and/or that retention is desirable in the first instance.

### The New Zealand Archaeological Association

NZAA recognises the importance of archaeological material in Principle 4 of its code of ethics (which forms part of the organisation’s constitution): “Members have an obligation to ensure, wherever possible, the protection, preservation and conservation of the sites and objects they deal with” (NZAA 2019). Much like the HNZPT documents, however, there is no explicit recognition of the need to protect, preserve, etc, the associated documentary record. In addition to this principle in the code of ethics, NZAA’s strategic plan (2020-2025) contains the following target: “Ensure that archaeological material is appropriately curated and shared for current and future generations” (NZAA 2022: 9). The actions associated with this target are:

- Advocate for the long-term retention of archaeological material in appropriate repositories.
- Develop a plan to provide best practice guidance for archaeological material and data preservation (i.e. storage and curation).

### The significance of the problem

The lack of institutions prepared to take archaeological material, the lack of guidelines about how best to archive an archaeological project and the lack of a requirement to do so are issues of increasing importance in Aotearoa as the volume of archaeological work carried out continues to grow. This situation is leaving valuable archaeological collections at risk. A case in point is the collection of archaeological material recovered as result of the Canterbury earthquakes of 2010-11. This internationally significant collection documents the entire history of human occupation of the area

we now know as Ōtautahi Christchurch, from the arrival of the earliest Polynesian settlers through until 1900. It is particularly important because of its power to shed light on how people have lived in this place for a period of some 800 years, how they have responded to the changing environment and because of its power to interrogate the colonial process and its impact on Māori, to document the development of a city and to present the tangible reality of people's lives alongside the social and cultural worlds they inhabited. This collection survives, but only thanks to private efforts (my own included, through the Christchurch Archaeology Project<sup>4</sup>).

Aotearoa's archaeological archives are a taonga in their own right, an important and irreplaceable record of our past. While technical reports are produced as a result of archaeological work, they are produced for a very specific purpose (meeting legislative requirements) and can never answer all the questions that could be posed of a given site. Nor are they particularly useful for a more general audience. Further, they are static documents, retained in pdf format, and thus difficult to extract data from for re-analysis or for incorporation into other, larger research projects. As such, they are poorly placed to address bigger, thematic questions or to answer research questions at an inter-site level. If we lose the archaeological materials associated with these sites, we lose the possibility of answering such questions and of achieving the best possible understanding of our past.

## **LEARNING FROM INTERNATIONAL BEST PRACTICE**

I applied for the WCMT Fellowship in recognition of the fact that, if we are to solve this problem in Aotearoa, there are a number of examples of repositories internationally that we can learn from. For my fellowship, I chose to visit a range of physical and digital repositories in England and the USA to better understand what works and what does not, what the biggest challenges are and how these can be mitigated. In addition to the visits and interviews, I have read widely on the topic of archaeological archives and repositories, particularly the guidelines, etc, of the repositories visited and their allied organisations. Of these, some of the most useful documents were those produced as part of the Futures for Archaeological Archives Programme (FAAP) in England, being run by Historic England. This is a programme set up by Historic England, with government support, to solve what is often referred to as 'the collections crisis' – essentially, repositories in England are running out of space to store archaeological collections. Various components of this project are referred to below, and the project is discussed in more detail at the end. I have also spoken to those involved with the archaeological repository at Heritage Victoria and the archaeozoological laboratory at Te Papa.

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<sup>4</sup> <https://www.christchurcharchaeology.org/>

As part of my Fellowship I met with the following people:

- Michol Stocco. Archaeological Archive Manager, Museum of London
- Duncan H. Brown, Archaeological Archives Principal, Historic England<sup>5</sup>
- Samantha Paul, Heritage Consultant (with particular expertise in the long-term storage of archaeological archives)
- Dr Tim Evans, Deputy Director, Archaeology Data Service (ADS)
- Amanda Sutphin, Director of Archaeology, NYC Archaeological Repository: The Nan A. Rothschild Research Center
- Patricia Sanford, Director, Maryland Archaeological Conservation Laboratory (MAC Lab)
- Jack Gary, Director of Archaeology, Colonial Williamsburg Foundation (CWF)



## KEY LESSONS LEARNED

### Indigenous archaeological material and data

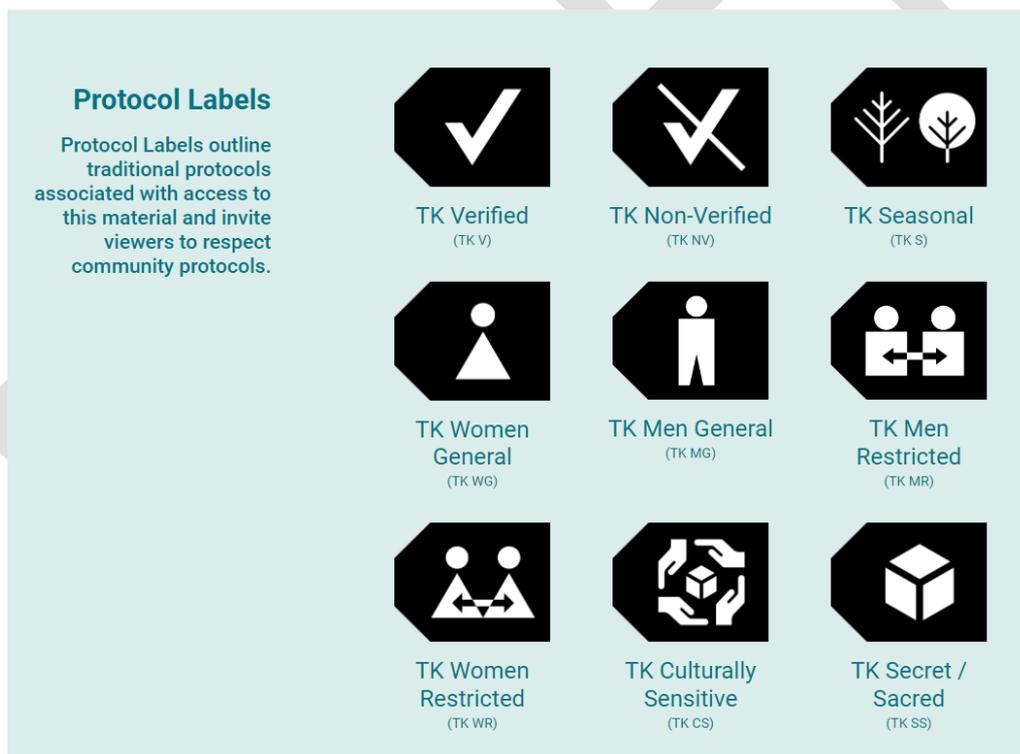
Indigenous archaeological material is not relevant in England, but each of the American repositories visited held material from Native American archaeological sites. This material is owned by the landowner at the time the archaeological work was carried out, not by the relevant Indigenous group. For these repositories, there has been some discussion with the relevant group(s) about reburying this material but no decisions have been arrived at yet. From a legal standpoint, it is difficult to rebury

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<sup>5</sup> Now retired.

material, as federal and state laws require the material to be retained in a suitable repository (R. Nims, pers. comm., 18/8/2022).

Digital data is just as important to Indigenous groups as physical materials. This being the case, the Global Indigenous Data Alliance has developed the CARE principles: Collective benefit, Authority to control, Responsibility, Ethics (GIDA, n.d.).<sup>6</sup> These sit alongside the FAIR principles of data (Findable, Accessible, Interoperable and Reusable), and recognise and respond to the issue of Indigenous data sovereignty. None of the repositories visited had taken any particular steps in this direction and none deployed Traditional Knowledge Labels, although queries had been raised with the NYC Repository about this and it may be something they investigate in the future. Traditional Knowledge Labels are a means by which Indigenous rights over digital data can be acknowledged. These labels can also be used to control how the data is used and shared (Local Contexts 2023).



Examples of Traditional Knowledge Labels. Image: Local Contexts 2023.

<sup>6</sup> Te Mana Raraunga Māori Data Sovereignty Network is an active participant in the Global Indigenous Data Alliance.

## Financial viability

With the exception of the NYC Archaeological Repository and CWF, the repositories visited charge for the deposition of archaeological archives, with a per box (or dataset) charge.<sup>7</sup> Some also charged administrative fees, and fees for other services, such as renting out space, tours and/or other public archaeological programmes. None charge for access to the material, and maintaining free access to the material was typically one of their core principles. In no case were the deposition fees sufficient to fund the operation of the repository. The fees were typically supplemented by core funding from state, federal or crown agencies or funders. Partnering on research grants provided funding for some repositories, and ADS generates additional income through developing computer applications for other parties. As such, it is not surprising that each of these repositories operate under financial constraints, and most felt that they did not have sufficient staffing to meet their requirements.

Sustainable costing models for storing archaeological materials are being investigated as part of FAAP, and a report on this is due at the end of 2023. Dr Samantha Paul is working on this project, and noted that the true costs of archaeological storage are not well understood, with the fees that many repositories in England charge being akin to back-of-the-envelope calculations. Not only are the costs not well understood, these costs are significantly underestimated. For example, The Arc (a repository in Northamptonshire) currently charges £120/box.<sup>8</sup> However, it estimates that £450/box would be required to cover the yearly costs of storing the material – this does not cover the cost of storing the material in perpetuity. Dr Paul's research has also found that the average deposition costs for projects were highest for projects with a small budget, being close to 4% of the overall project cost, while the costs for higher budget projects were no more than 2% of the overall project cost. The model that both she and Duncan Brown favour for long-term sustainability is charging a levy on the project costs, agreed at the outset of the project. Dr Paul's research has also found that, on average, archaeologists are spending 3.5% of project costs on archiving, but should be spending 7% (Paul n.d.).

The levy that Dr Paul favours would only meet the running costs of a repository, not any establishment costs. Establishment costs are significant, as indicated by the costs of the proposed new archaeological repository at CWF (over \$35 million USD for 40,000 square feet), the expansion at the MAC Lab (approximately \$20 million USD, for a new build of 4362 square feet and a renovation of 9000 square

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<sup>7</sup> As a general rule, CWF only curates and conserves collections it has generated. The NYC Repository operates from space that has been donated to it and some of their other operational costs are met through a mitigation payment.

<sup>8</sup> For material from fieldwork from April 2020. This recognises that budgets for deposition fees are generally established before the fieldwork is carried out, and that there may be a considerable delay between the fieldwork taking making and the archive being deposited.

feet) and the estimated costs for developing a sustainable long-term storage facility (or facilities) in England (£48-63 million for a new build, depending on the option, or £9 million to outfit an existing building, with operational costs estimated to be £1.9-5.3 million; Carroll et al. 2021: 40).

### The problem of digital data

As noted above, archaeological data is increasingly born digital. This data ranges from relatively simple file formats, such as Microsoft Word documents, through to far more complex formats such as LiDAR, GIS and photogrammetry. Not only are these latter files more complex, they are also much larger in size, requiring considerable server space to store them. Management of this data requires ensuring files remain virus- and corruption-free, as well as being able to be opened and used as software versions change. It may also require managing data and files from a myriad different programmes and applications, some better known than others. My conversations with ADS, and my own experience, suggests that archaeologists are better managers of the physical archive than the digital one, perhaps reflecting the training they receive.

Managing this digital data is an increasingly specialist skill set, as evidenced by the existence of repositories that only archive digital material (whether born digital or analog) – for example, ADS in England and The Digital Archaeological Record (tDAR) in the United States. It is also recognised by the Chartered Institute for Archaeologists requirement that digital data is deposited with a Trusted Digital Data Repository, with accreditation from Core Trust Seal (Forster 2019: 8, 18-19).<sup>9</sup> Further, one of the repositories visited was about to advertise for a digital archivist at the time of my visit, while the Museum of London archive is likely to only accept physical archives in the future, and require that digital files are deposited with ADS. Likewise, the MAC Lab currently stores all its digital files with tDAR.

In recognition of the particular challenges that digital data poses, the Archaeological Archives Forum (AAF) in England has recently developed a resource called Dig Digital.<sup>10</sup> This is essentially a tool to help archaeologists manage digital data throughout the course of an archaeological project, thereby making the process of archiving this data at the end of the project much simpler. In particular, it includes details about how to develop and maintain a data management plan (which forms the foundation of the digital archiving process). It also includes detailed guidance about how to ensure

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<sup>9</sup> Both ADS and tDAR are accredited repositories.

<sup>10</sup> This is one of the outputs of FAAP.

the data deposited meets the FAIR principles (Forster 2019). Dig Digital is supported by England's professional archaeological body (CifA) and aligns with their standards and guidance.

Another output of FAAP has been guidance that makes it clear that museums should not collect digital archaeological archives, but should instead be deposited with a suitably accredited repository. This recognises the complexities of the long-term management of this data (Society for Museum Archaeology 2020: 12, 17).

### Space

None of the physical repositories visited had sufficient space, whether for storage and/or day-to-day operations. As noted above, both CWF and the MAC Lab are about to embark on building projects that will give them more space. This is not the only driver for CWF's redevelopment (the new facility will mean they are more centrally located and have much better outreach facilities), but this redevelopment will see their total floor area double in size. Likewise, the MAC Lab's redevelopment will double their storage space (as well as adding further conservation facilities), which will give them sufficient storage for the growth in collections estimated over the next 20 years (they had hoped to get funding sufficient to cover the estimated growth over 40 years but this was not possible). The NYC Repository is also hoping to acquire an adjacent space that would see its size double. The situation at the Museum of London is complicated by a redevelopment of the museum itself, which is requiring that the archaeological repository condense its collections, an aim it is realising through a repackaging project.

The Museum of London's repackaging project is itself illustrative of some of the challenges that repositories face. This project began in September 2022, and means that all its archaeological archives are being repackaged and relabelled. At the same time, the material is being entered into a collections management system (for the first time) and given a barcode. A pilot study carried out before the current project began reduced 1100 boxes to 960 (smaller) boxes. A lesson learnt from the pilot study was that it is critical that box size is matched to shelf size and the gaps on the shelves should be minimised, to minimise the waste of space. To this end, the material is being repackaged into standard sized boxes. The total number of boxes will also be reduced by combining half-full boxes – it is estimated that this will save 10,000 boxes. The pilot study found that it took, on average, 1-1.5 hrs to repack and relabel a box. Knowing this figure has enabled the careful calculation of how long the project will take: it will be completed in 2029, with 10 people working on the project.



**The mixture of box sizes currently used in the Museum of London archaeological archive.**

Of relevance here is that, when the issue of the lack of space in archaeological repositories is raised, there are often suggestions that a repository's collections should be rationalised.<sup>11</sup> The Museum of London participated in a 2017 study investigating how such a rationalisation might reduce the size of its collections (Baxter et al. 2018). The museum was one of six institutions to participate in this study. The study found that, while rationalisation was a useful exercise in terms of helping these institutions understand more about their collections, the costs involved did not justify the amount of space likely to be gained through carrying out the rationalisation.<sup>12</sup> Nonetheless, soil samples and the stone collection (this is largely building stone) at Museum of London are being rationalised. The stone collection will be assessed by a specialist, who will inspect every piece of stone and make a recommendation on each one. It is anticipated that most of the plain worked stone will be disposed of, but the remainder will be kept. In a similar vein, the NYC Repository had considered deaccessioning its samples of building mortar. Detailed investigation, however, revealed that (a) useful information could be gained from the mortar samples and (b) there was considerable variety amongst the samples, and that this information could only be revealed through detailed analysis that was not typically carried out for technical reports.

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<sup>11</sup> In this context, 'rationalisation' refers to assessing the extent and contents of the collection and then determining what needs to be retained for the future.

<sup>12</sup> None of the institutions involved in the study got as far as being able to rationalise all or part of their archaeological collections during the project. For more information, see Baxter et al. 2018.

## Archaeological consultants, repositories and archives

While these repositories are all running out of space, they – and ADS – all noted that consultant archaeologists are not good at depositing their archaeological archives and that there are large backlogs of material that are essentially waiting to be deposited (with the exception of CWF, which does not generally take material from archaeological consultants). In London, this backlog is estimated to be the same size as the current holdings in the Museum of London. At the MAC Lab, they were not able to state the volume of material that is outstanding but described it as ‘scary’. Rather than depositing their archaeological archives, many consultants simply hold onto the material themselves, sometimes paying to store it offsite. There was little sense that consultancy firms in England were discarding archaeological material, but there was less clarity about this in the US. The most commonly cited reason for consultants not depositing material was the cost to do so. This, of course, ignores the fact that such costs can (and should) be built into a project budget from the outset. Further, if an archive is not deposited in a repository but is retained by the consultancy, storage costs will still be incurred, for both the physical and documentary archives. It is clear from both the English and American experience that it is critical to budget for archiving costs (both time and the deposit fees) at the outset of an archaeological project, in the same way that any other cost must be budgeted for.

Part of the problem may also be that preparing a project to be archived can be perceived as – and, if not planned for from the outset, can be – an onerous and time-consuming task, particularly with regards to the documentary archive, and particularly for digital data. The potential scale of the task of data management is illustrated by the fact that some archaeological consultancies in England employ an archivist, and some may employ as many as three or four, depending on the size of their operation. Tools like Dig Digital (described above) and other standards and guidance (discussed below) have been designed to make the archiving process easier.

An additional problem in England is simply that many archaeological repositories are running out of space and, as a consequence, refusing to take archaeological archives. In some instances, then, there are archives that essentially have nowhere to go – a recent analysis suggests that this is over 20% of the archives that are generated every year, amounting to 100 m<sup>3</sup>/year (Carroll et al. 2021: 13).<sup>13</sup>

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<sup>13</sup> In addition, this research also indicated that all available archaeological repositories in England would be full within 10 years (Carroll et al. 2021: 31).

### Transfer of legal ownership

In England, archaeological material is legally the possession of the landowner at the time the archaeological work is carried out (as in Aotearoa). The same is true in the USA, excluding human remains. One issue that was identified as potentially hindering the deposition of archives in suitable repositories in England is arranging the transfer of ownership of the material from the landowner to the repository. In England, the ownership of archaeological material is supposed to be resolved at the outset of the project, through the Written Scheme of Investigation (WSI; similar to the assessment phase in Aotearoa), but these are often signed off on by the developer, rather than the landowner, meaning that the landowner may be unaware of their obligations. Further, archives are often signed over to a particular museum as part of the WSI but with no consultation with the museum in question (this will hopefully change as a result of new online systems for managing archaeological processes). This problem of the transfer of legal title is one that is experienced by landowners, archaeologists and repositories across England. In recognition of this, and as part of FAAP, Historic England commissioned a standardised Deed of Transfer to be used for archaeological archives and are now developing guidance about its use, for all stakeholders (Historic England, 2023).

Of note is that one repository deliberately did not take ownership of the archives deposited with it. Instead, ownership is retained by the agencies who deposit the material. This is because, if the repository loses its space, they want the collections to remain the responsibility of the depositing agency, who will then have to find a long-term home for it.

### Future-proofing

As outlined above, one element of future-proofing the sustainable long-term storage of archaeological archives is having sufficient space to store new collections that are being generated. Another is planning for what will happen if the existing repository collapses. One repository has considered this through their ownership model. ADS have taken a different approach. Any surplus they generate goes into a longevity fund, which is being built up to be sufficient to resource the transfer of the data to another suitably accredited repository, should ADS close down. This fund ensures the sustainability of the archive and future-proofs it. It is clear that such a fund, or contingency, should be a key component of any repository's operation, along with disaster management plans that take account of a range of scenarios, such as software or hardware failure, ransomware attack, fire, flood or earthquake, to name just a few.

## Selection strategies

Not everything needs to be retained. On the other hand, archaeologists (and museum staff) are not good at discarding material from collections, even when specialists say that something is not worth keeping. This was found to be the case by Dr Samantha Paul during her doctoral research, and also noted by Michol Stocco at the Museum of London. The Museum of London has historically taken entire collections, but in the future, the collections deposited will have to go through a documented selection process, whereby some items are retained for the future but others are not. CWF's role as custodian of the archaeological material from what is essentially one very large archaeological site means it was the only one of the repositories to have policy about the specific materials it retains: it keeps everything that is recovered from its excavations, with the exceptions of bricks, oyster shells, mortar, slag, non-diagnostic glass and non-diagnostic ceramics, all of which it samples.

In England, ClfA have developed a toolkit to help archaeologists select the documentary and physical materials to be included in the archaeological archive for a project, based on:

- the aims and objectives of the project;
- local authority guidance;
- the collecting institution's collection policies and/or deposition guidelines;
- local and regional research frameworks;
- relevant thematic or period-specific research frameworks;
- the project's data management plan;
- internal recording and reporting policies; and
- material-specific guidance documents.

ClfA n.d.

This selection toolkit includes a selection strategy template, which requires practitioners to document why particular documents, data and physical materials were selected to form part of the project archive. In addition, decisions about any items that were de-selected must also be documented. This recognises that not all material needs to be kept, but that what is not kept must be carefully documented, to enable future users of the archive to best understand its contents (ClfA n.d.). This selection toolkit and Dig Digital are considered to be important innovations, and it is anticipated that they will make the task of managing archaeological archives – by both archaeological consultants and repositories – significantly easier, as well as ensuring that the decisions made about archiving are more robust and transparent.

## Research frameworks

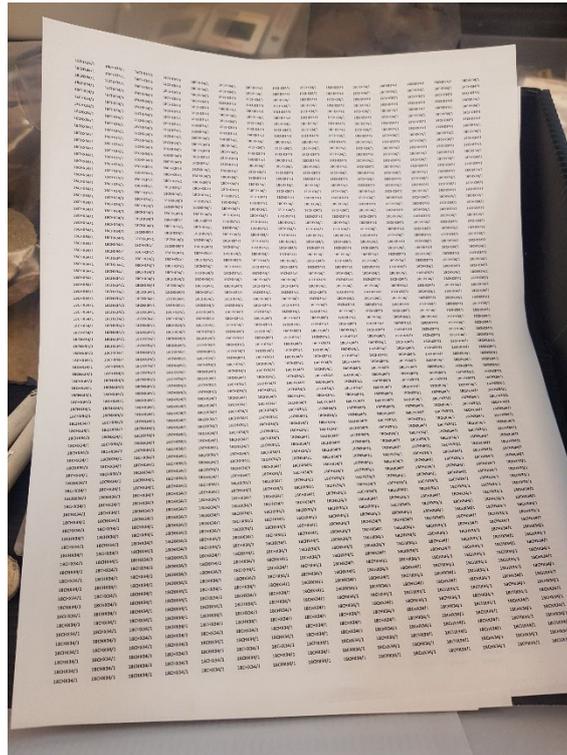
In England, research frameworks are a key part of the archiving process, as noted above with regard to ClfA's selection toolkit (ClfA n.d.). Such a framework was of less relevance to the repositories visited in the US. Research frameworks help determine the significance – or otherwise – of a particular archaeological archive, and thus help determine what it is important to keep (Schacht 2010). This is also recognised by European guidelines (Perrin et al. 2014: 25). Research frameworks have a range of benefits that extend beyond their use in archiving archaeological projects, but it is important to recognise their use in the latter. A detailed set of research frameworks for England, Scotland and Wales is available, some of which are related to geographic areas, some to particular time periods and some to particular themes (Research Frameworks 2023).

## Standards and guidance

Each of the repositories had its own set of standards and guidance, freely available on its website. These provide fine-grained detail about what needs to be submitted and how, including whether or not (and how) artefacts should be labelled, how artefacts should be packaged, how files should be named, the metadata that needs to be deposited with the archive, the size of boxes to be used and forms to be completed at the time of deposition. Some also include information about how to clean different types of artefacts, conservation treatments and lists of additional resources. In England, ClfA has produced standards and guidance on managing archaeological archives, based on guidelines produced by the Archaeological Archives Forum (Brown 2011, ClfA 2020).<sup>14</sup> These documents provide higher-level guidance, but necessarily takes account of the fact that each repository in England will have its own specific requirements. These standards and guidance are critical for minimising how much time a repository has to spend processing a collection when it is deposited, and mean that many of the problems of older collections can be avoided. They thus improve both the efficiency and sustainability of the repository, and ensure that the archive can be used by researchers in the future. In addition, one repository noted that publishing their guidelines had seen an overall improvement in the practice of archaeology in the area.

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<sup>14</sup> The ClfA standards and guidance are under review as part of FAAP (Historic England, 2023).



### Printed artefact labels, to be affixed to artefacts, MAC Lab.

For someone interested in the development of a repository, these standards provide a wealth of information about best practice, as well as the range of fine-grained issues that need to be taken into consideration.

### Data management

The approaches the repositories take to managing the data about the collections they holds varies. For example, as part of its repackaging project, the Museum of London archaeological archive is entering the data about its collections into the collections management system used by the museum as a whole. Likewise, the MAC Lab uses the same database as the Jefferson Patterson Park and Museum (the organisation within which it is based). The NYC Repository currently has a database built by Keepthinking, which attempts to function both as an archaeological database and a collections management system. This recognises the problem identified by Dr Paul, whereby archaeological archives do not fit easily with museum software solutions (see also Carroll et al. 2021: 7). Much of Dr Paul's work has been focused on the storage of archaeological collections within museums, leading her to the conclusion that artefacts in museums become museum collections, and are treated and managed as such. Collections management systems for museums are geared towards individual objects, each of which has an accession number, which is not practical for archaeological collections,

which might consist of thousands of object. Dr Paul prefers an approach where each site has an accession number, and sub-numbers can then be used for items within that archaeological collection. This then keeps the items connected, whereas giving them an individual number does not. Connections between the individual elements of an archaeological collection are critical to the management of that collection – nobody thinks that splitting up a physical collection is a good idea. Dr Paul's views were supported by Jack Gary – CWF uses a collections management system that he described as great for tracking the location of objects, but not good for analysis.

The NYC Repository is in the process of developing an artefact analysis database in Microsoft Access, which all those submitting material to the repository will be required to use. This will enable the comparison of data from different sites, and help standardise analytical techniques. The MAC Lab has in the past considered building such a database but, at the time, determined that this was not a priority, given the amount of work and costs involved and other challenges facing the facility. Dr Samford did note, however, that having one would be the ideal. Amanda Sutphin indicated that the NYC Repository had staged and developed their project very carefully, in order to ensure the support of local archaeologists.

### Making the archive reusable

Unsurprisingly, the level of reuse of the material in the repositories varied. With the exception of graduate students, very few external researchers used the material at CWF. At the other end of the scale, the MAC Lab has about 30 external researchers visit each year. The other physical repositories had relatively low numbers of visiting researchers (covid may well have affected these numbers). At the NYC Repository, it had taken a while to establish relationships with local universities, but once a professor brought a class to the repository, that professor tended to keep coming back with more classes. High schools, however, have proved more challenging for this repository.



**Visiting Scientist room, MAC Lab.**

ADS is particularly concerned about the issue of reuse. The FAIR principles for data (Findable, Accessible, Interoperable and Reusable) sit at the heart of ADS's work and, while it has a good understanding of how it is performing in terms of being findable, interoperable and accessible (and is doing well on its metrics in those regards), the picture is less clear when it comes to how reusable the data, and how much it is reused. This is also important because ADS need to provide evidence of the reuse of the data they hold to secure and retain their core funding. Dr Evans noted that people are not good at citing ADS when using data from the repository, a problem also outlined in a report into the use of archaeological collections in doctoral research (University Archaeology UK 2022). As such, ADS has developed an API to query for the use of ADS DOIs. ADS are also adding hashtags to the metadata for a project (such as famous people's names), which is useful when the public are searching for information about these people, but also makes the data more accessible internally, for social media posts and other outreach activities. Another way ADS is seeking to mitigate this problem is through the TetrARCHs (Transforming data rE-use in ARChaeology) project. This project has received European funding to understand the ways in which archaeological data can be reused for storytelling and other creative projects and how to make that data more readily accessible to those specialists.

Understanding the reuse of archaeological archives is also a key focus of FAAP. Research has investigated how many doctoral theses use existing archaeological collections (the short answer being less than half between 2010-2020/1; University Archaeology UK 2022). Further research is being carried out with museums over an 18-month period, to investigate who is using archaeological collections and what for. The results of this analysis will not be available until late 2024/early 2025. Duncan Brown suggested that it takes a generation before a collection is reused, and most of those

spoken to agreed that archaeological consultants were the archaeological role least likely to reuse an archive, as they simply had little need to in their line of work (unless revisiting a site that had been investigated previously).

### Volunteers

With the exception of ADS, each of the repositories visited have volunteers, albeit to a limited extent. In most cases, changing ideas about what is appropriate work for volunteers, and the benefit they must receive from that work, had affected the number of volunteers used.

### Outreach and websites

All of the repositories undertook some form of outreach and, with the exception of CWF, had a website. The Museum of London's archaeological archive website is also quite limited. For some, outreach was hosting tours, while others run specific programmes, such as the MAC Lab's Discovery Day and Witnesses of Wallville project. For both the MAC Lab and the NYC Repository, their websites are an important means of both sharing data and engaging with the broader public. Both also have exhibition spaces associated with their facilities. Both have relatively detailed information about some of their collections available on their website, and this information is both searchable and browsable. The level of detail available is such that this information is of use to professional archaeologist, as well as the general public. The NYC Repository has a selection of fun (and popular) quizzes and a timeline that links significant events in New York's history with their archaeological collections. The MAC Lab has a number of diagnostic tools (the diagnostic artefacts page is the most used page on their website), a blog and an online exhibition developed in response to the *Outlander* television series. Both repositories saw these tools as a valuable part of their offerings, particularly because of the role of the website in getting people to engage with both the collections (a form of reuse) and archaeology in general. This being the case, the MAC Lab was hoping to further enhance their diagnostic artefacts webpage. Neither the Museum of London nor CWF have any information about their collections online.



The exhibition spaces at (left) the NYC Repository and (right) the MAC Lab.

### Key points

- Financial sustainability for an archaeological repository is difficult to achieve on a per box charging model.
- Digital archives are complex to manage and require a specialist skill set. Long-term archiving of this material should only be undertaken by an organisation with the necessary expertise and accreditation.
- Storage space will always be at a premium.
- It is critical to budget for archiving costs (both time and the deposit fees) at the outset of an archaeological project, in the same way that any other cost must be budgeted for.
- Guidance about the transfer of ownership of archaeological archives is useful for all stakeholders, as is a template for facilitating this arrangement.
- Not everything needs to be retained. Selection strategies ensure that the decisions about what is selected and what is not are clear and robust.
- Research frameworks are an important tool to help guide the selection of material for an archaeological archive.
- Standards and guidance are critical for the efficient and sustainable function of the repository.
- The reuse of archaeological archives is not well understood.
- Websites are a critical part of outreach programmes.

### **A WAY FORWARD?**

Throughout this report I have referred to FAAP, or the Future for Archaeological Archives Programme, being run by Historic England, and which I discussed in detail with both Duncan Brown and Samantha

Paul, both of whom are involved with it. As noted above, this is a programme that has government support, meaning that action will come as a result of it. It was set up in response to the 2018 Mendoza Review, to solve the problem of the collections crisis in archaeological archives. Further, the programme is looking for long-term solutions, not short-term ones. This programme is carrying out a broad suite of work, including:

- investigating the options for the long-term sustainable storage of archaeological archives in England, including whether or not a national repository or a network of regional repositories would be best
- investigating how archaeological collections are reused
- investigating and then make recommendations about a sustainable charging regime for the deposition and curation of archives
- reviewing and updating existing guidance and standards on the preparation, deposition and curation of archaeological archives
- obtaining legal advice about how best to manage the transfer of ownership
- investigating how rationalising existing museum collections could increase storage capacity
- reviewing regional research frameworks
- considering innovative approaches to archiving archaeological collections
- investigating how much storage is currently available (Historic England 2023)

What is important about this work programme is not so much the specifics of the work being carried out or the results, although these are useful, but the breadth of it and the holistic approach that is being taken. FAAP is not just about finding out (and establishing) a new repository or repositories, it is looking at the entire ecosystem around the deposition and curation of archaeological archives, and investigating the range of factors that contribute, such as costs and charging, standards, legal ownership, research frameworks, etc. It is not simply looking at a storage facility in isolation. From the research and interviews I have carried out, it is clear that any attempt to establish an archaeological repository must take such an approach. The specific work required in Aotearoa will not be the same as that in England – and must include extensive engagement with iwi Māori from the outset – but the approach must be broad in scope to ensure the sustainability of the outcome.

Of interest is that the recommended solution as a result of the work to date is establishing a national archaeological repository at the Science Museum National Collections Centre at the Wroughton airfield in Wiltshire (Historic England 2023). It is proposed that this facility sits alongside existing regional repositories (such as museums and facilities like The Arc), but collects that material that

otherwise has nowhere to go. It is anticipated that, as a consequence, some existing repositories will stop collecting archaeological archives and/or choose to deposit their existing archaeological collections in the new national repository. Another component of the recommended solution is an online database that indexes where all archaeological collections are held, regardless of the repository they are in (Carroll et al. 2021).<sup>15</sup> The proposed solution, then, is a relatively flexible one, and this is likely to be key to its long-term sustainability – and thus its success.

## **CONCLUSIONS AND FUTURE WORK**

Every day, archaeological projects are carried out in Aotearoa New Zealand that generate large quantities of archaeological material, most of which cannot be deposited in a secure long-term archaeological repository, because few institutions will take archaeological collections. This, then, is Aotearoa's collections crisis, and it means that we are at risk of losing valuable data that can help us gain a detailed and nuanced understanding of our past. This situation is contrary to international best practice, which does at least mean that, if we want to improve our archaeological archiving practices and, even, establish some sort of national archaeological repository, there is much we can learn from other jurisdictions. These lessons range from the minor and practical – for example, using appropriate-sized boxes – to the higher level, including that it is essential to take a holistic approach to establishing a repository, considering everything from the aforementioned box sizes through to the fees charged, the expertise required to manage digital collections and the ownership of material. In Aotearoa, Māori data sovereignty and the principles of Te Tiriti o Waitangi must also be fundamental considerations.

To develop a solution to Aotearoa's collections crisis will take time, and must commence with engagement with iwi Māori. It will also require work between a number of stakeholders, including NZAA, HNZPT, Manatū Taonga and the museums sector. To this end, I have already shared the results of my fellowship with both NZAA and HNZPT, and will be shared with more stakeholders, and it has informed a draft position paper that I am co-authoring for NZAA (see Appendix 1 for the full details of dissemination). This position paper contains a range of recommendations for future work – as these are only in draft and are currently pending feedback, they are not outlined here, but, essentially, it is proposed that a plan of work is developed, with the ultimate aim being to find a long-term solution to the collections crisis. It will be used as a basis for future consultation and engagement with key

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<sup>15</sup> As Dr Paul noted, there is no reason that this could not include material stored in people's sheds (and that, if it did so, this would be better than the current situation). As the work of Caitlin D'Gluyas and Martin Gibbs has shown, one of the biggest problems wanting to reuse an archaeological archive is finding where it is stored (D'Gluyas and Gibbs 2022). While their research focused on New South Wales, the same would be true of Aotearoa.

stakeholders, and will hopefully set Aotearoa on the way to developing a sustainable long-term solution to the current collections crisis in archaeology.

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## APPENDIX 1: DISSEMINATION

To date, the lessons learned from my fellowship have been shared in the following ways:

- a verbal and written presentation to the HNZPT Board and the Māori Heritage Council (29 June 2023);
- a verbal presentation to the NZAA conference (7 July 2023); and
- they have helped inform a position paper on the long-term storage of archaeological collections for NZAA (co-authored with Emma Ash and still in draft at the time of writing).

Upon completion and final approval, this report will be uploaded to the Christchurch Archaeology Project website, where it will be freely available ([www.christchurcharchaeology.org](http://www.christchurcharchaeology.org)). It will also be distributed to key staff at HNZPT (and it is hoped to also have an in-person discussion about it), Manatū Taonga and to the NZAA Council. The information I have learned from the fellowship will continue to inform the NZAA position paper, and the work that comes out of that (this paper contains a number of recommendations for future work on this matter).

Other benefits that have come from my fellowship include:

- the appointment of Dr Tim Evans, Archaeology Data Service, to the Project Advisory Group for the Christchurch Archaeological Project database build.
- Dr Holly Wright (Archaeology Data Service) will be presenting in a session I am chairing at the Computer Applications and Quantitative Methods in Archaeology in Tāmaki Makarau in April 2024.
- The information I learned has been invaluable in the planning and development of the Christchurch Archaeology Project database ([www.christchurcharchaeology.org/the-database](http://www.christchurcharchaeology.org/the-database)).